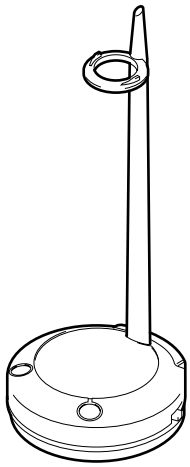
TMR-RF450R

SERVICE MANUAL

AEP Model

Ver 1.0 1998.06



TMR-RF450R is the component model block one in MDR-RF430RK/RF450RK.

COMPONENT MODEL NAME FOR MDR-RF430RK/RF450RK

	MDR-RF430RK	MDR-RF450RK
Wireless Stereo Headphones	MDR-RF430	MDR-RF450
Transmitter	TMR-RF450R	TMR-RF450R

SPECIFICATIONS

General

Carrier frequency	433.40 – 434.40 MHz
Channel	Ch1, Ch2, Ch3
Modulation	FM stereo
Frequency response	20 – 20,000Hz (MDR-RF430RK)
	18 – 22,000Hz (MDR-RF450RK)

Transmitter

Power source	DC 9V : supplied AC power adaptor
Audio input	Phono jacks / stereo mini jack
Dimensions	Approx. 120 mm dia x 290 mm
	(4 3/4 x 11 1/2 in.) (w/h)
Mass	Approx. 155g (5.5oz.)

Design and specifications are subject to change without notice.

RF STEREO TRANSMITTER

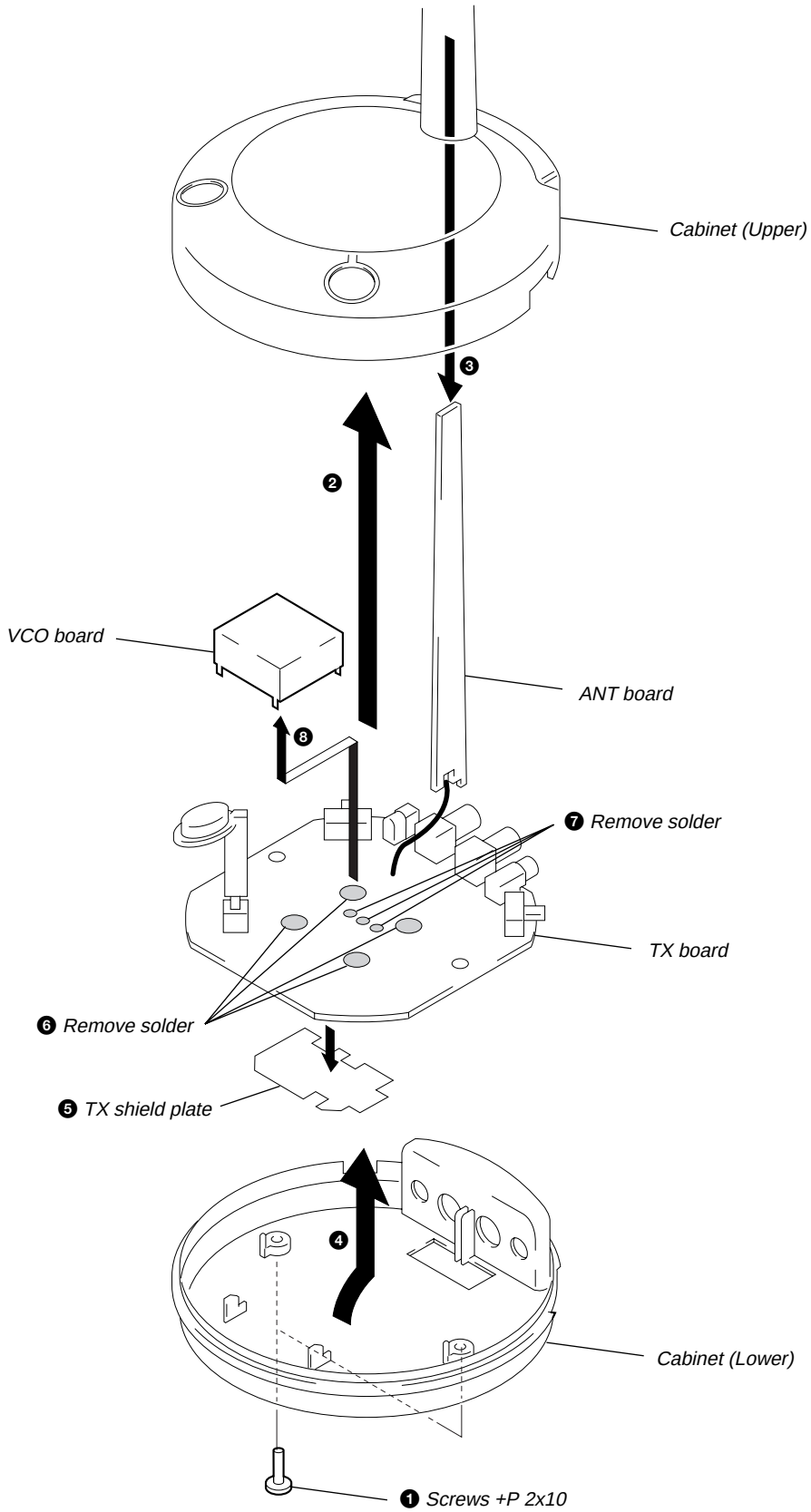
MICROFILM

SONY®

SECTION 1
DISASSEMBLY

Note : Follow the disassembly procedure in the numerical order given.

1-1. TX BOARD REMOVAL



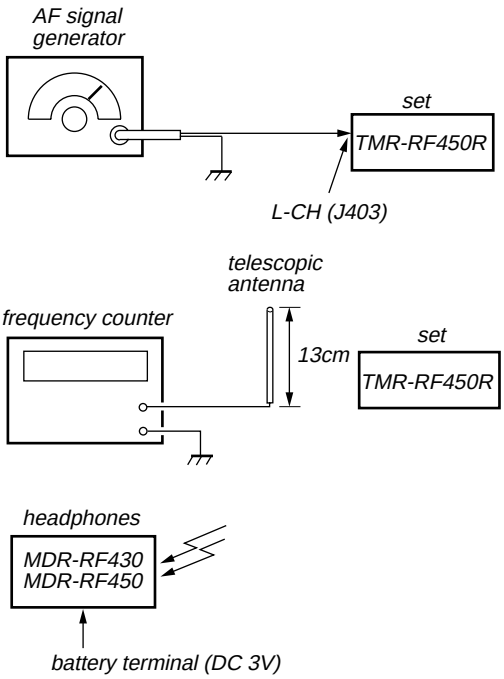
SECTION 2
ELECTRICAL ADJUSTMENTS

Note :

1. The transmitter section adjustments should be completed before performing the headphones section adjustment.
2. On adjusting the transmitter section, use the headphones as a jig.

Transmitter	Headphones
TMR-RF450R	MDR-RF430 MDR-RF450

Setting :



Send Frequency Check and Adjustment

1. Set the noise filter SW to OFF.
2. Input a signal of 1kHz 40mVrms to only the L-ch (J403).
3. Connect a telescopic antenna to the frequency counter input and extend the antenna to a length of approximately 13cm.
4. Place TX board close to the frequency counter, then measure the frequencies of CH1, CH2 and CH3 and make sure the values are as follows:

   CH1 : 433.3 – 433.5MHz
   CH2 : 433.8 – 434.0MHz
   CH3 : 434.3 – 434.5MHz

If the measured values are other than the values specified above, adjust the frequencies by turning RV402 and RV403 on the TX board. When completed with adjustment, recheck the frequencies of CH1, CH2 and CH3.

Connection points and Adjustment Location :

TX board (See page 4)

Sub-Carrier (L-R) Modulation Check and Adjustment

1. Set the noise filter SW to OFF.
2. Set the channel to CH2.
3. Input a signal of 1kHz 316mVrms to only the L-ch (J403).
4. Measure the pin ① voltage of the TX board IC403 using an digital voltmeter (AC range) and make sure the value is 220 – 250mVrms. If the measured value is other than the specified value, adjust to 235mVrms by turning the RV401 on the TX board.

Connection points and Adjustment Location :

TX board (See page 4)

Sub-Carrier Frequency Check and Adjustment

1. Set the noise filter SW to OFF.
2. Set the channel to CH2.
3. Input a signal of 1kHz 316mVrms to only the L-ch (J403).
4. Connect a frequency counter and an oscilloscope between the Q409 emitter and GND.
5. Set the TX board L-ch (J403) input to OFF (not doing so will cause modulation in the sub-carrier, preventing correct measurement)
6. Check to make sure the frequency counter reading is 48 –52kHz. If the measured value is other than the specified value, adjust the frequency to 50kHz by turning the RV405 on the TX board. In addition, check to make sure the oscilloscope waveform is as follows :

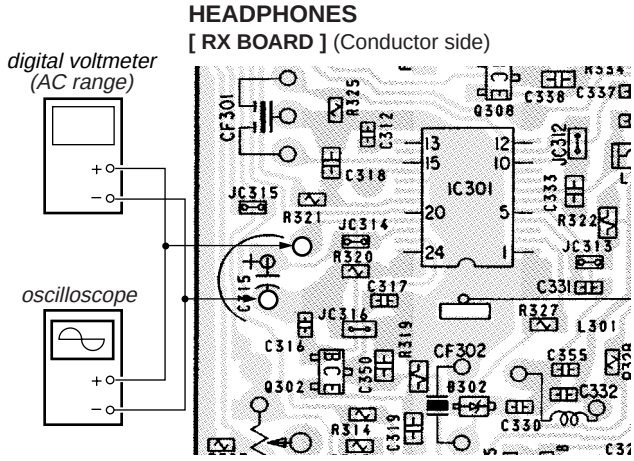
(Perform the check and adjustment within one minute since the transmitter AUTO OFF function will be activated approximately one minute after setting the transmitter L-ch input to OFF. If the AUTO OFF function activates, set the L-ch input to ON, set TX board to AUTO ON, set the L-ch input again to OFF, then make the check adjustment.)

Connection points and Adjustment Location :

TX board (See page 4)

Main Carrier Modulation Check and Adjustment

1. Set the channel to CH2.
2. Set the noise filter SW to OFF.
3. Input a signal of 1kHz 316mVrms to only the transmitter Lch (J403).
4. Set headphones VOL (RV301) to MIN.
5. Connect an digital voltmeter (AC range) and oscilloscope between IC301 pin ㉑ and GND on RX board (headphones).
6. Receive signals by turning headphones TUNING VOL (RV302).
7. First check to make sure that a demodulated waveform of 1kHz is outputted to the oscilloscope, then check to make sure the digital voltmeter (AC range) reading is AC 12 –15mVrms. If the reading is not within the specified range, turn RV404 on the TX board so that the reading is 13.5mVrms.

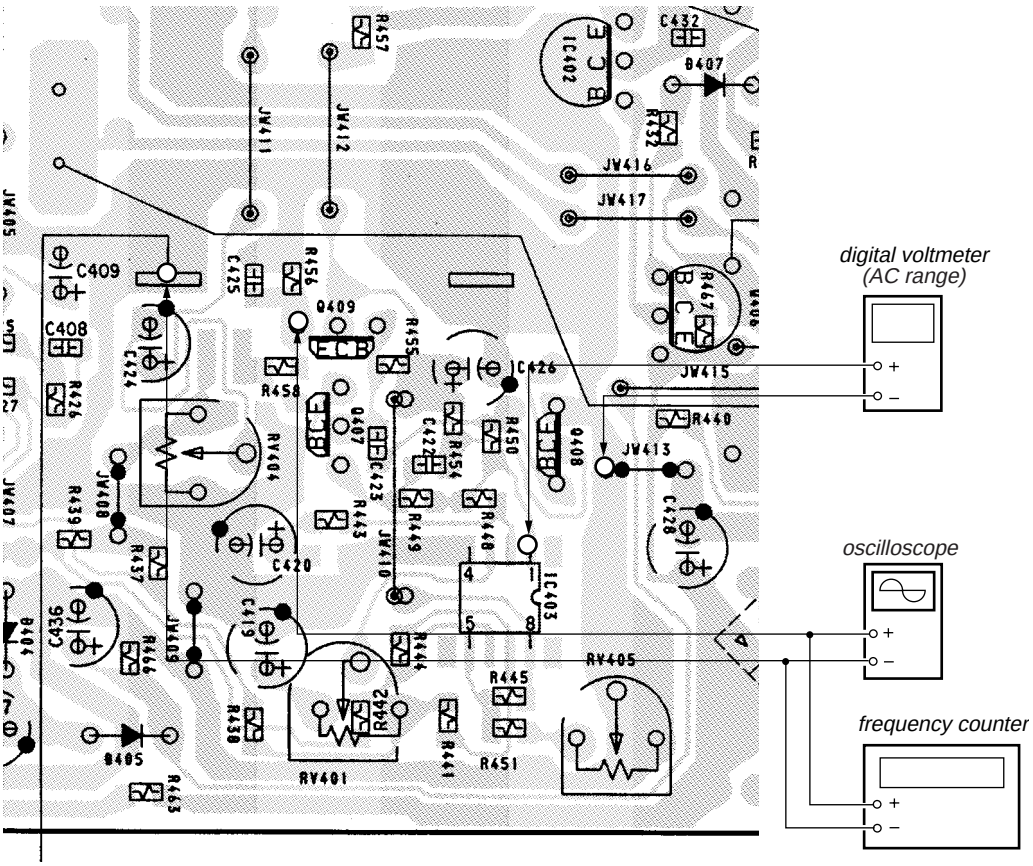


Connection points and Adjustment Location :

TX board (See page 4)

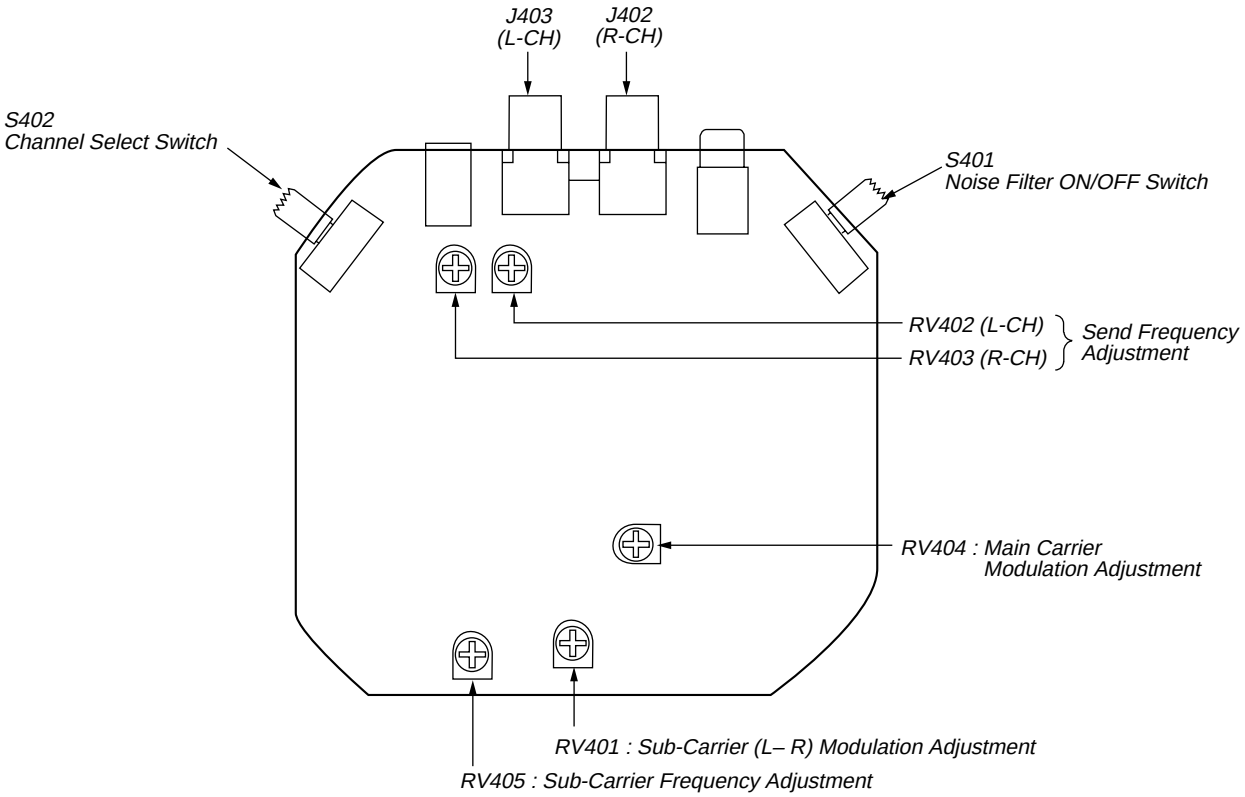
Connection points :

[TX BOARD] (Conductor side)



Adjustment Location :

[TX BOARD] (Component side)

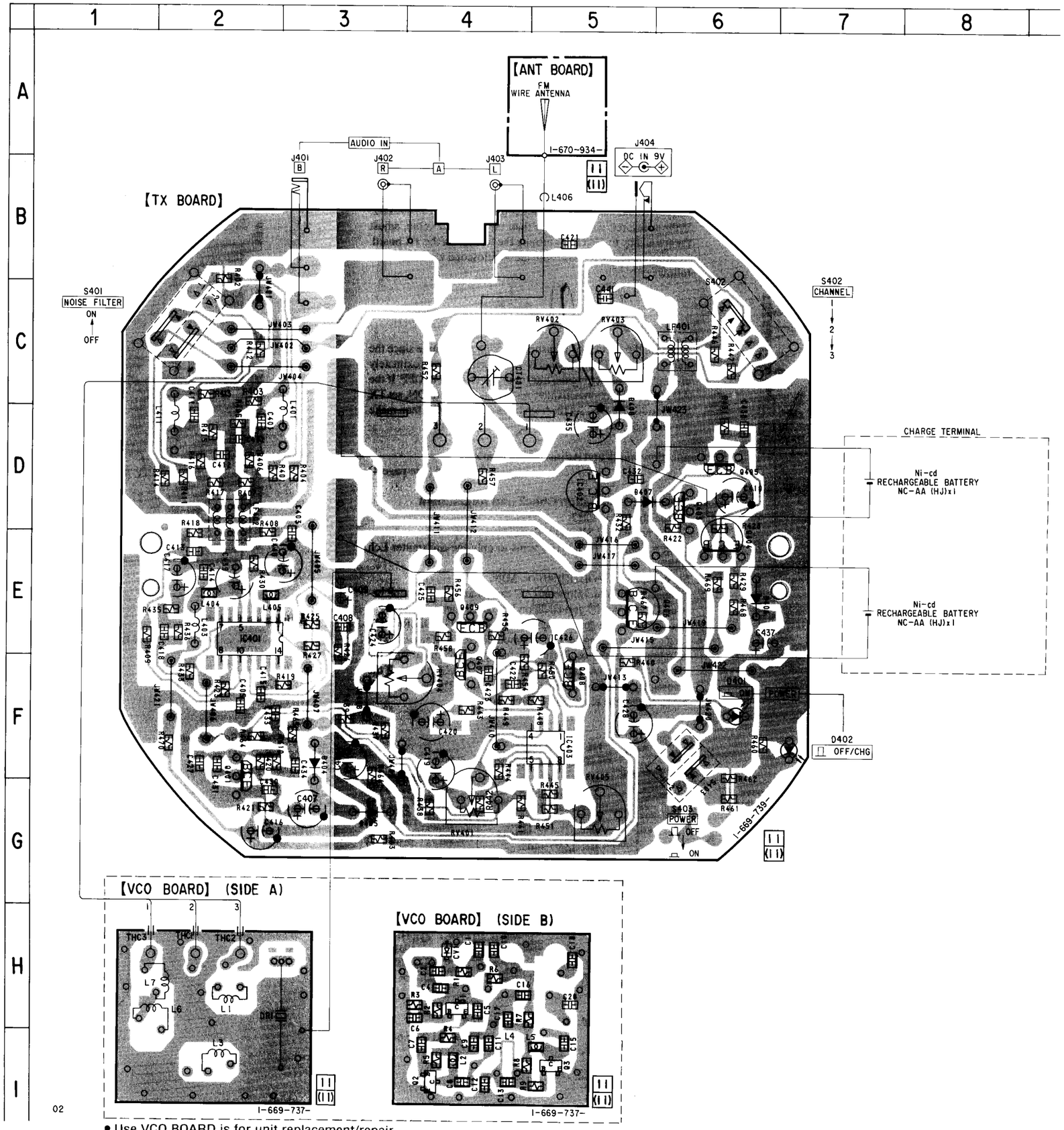


SECTION 3 DIAGRAMS

3-1. PRINTED WIRING BOARDS

- **SEMICONDUCTOR LOCATION**

Ref. No.	Location
D401	F-6
D402	F-7
D404	F-3
D405	G-3
D406	E-6
D407	D-5
D408	C-5
IC401	E-2
IC402	D-5
IC403	F-5
Q1	H-4
Q2	I-4
Q3	I-5
Q401	F-2
Q403	D-6
Q404	E-6
Q405	D-6
Q406	E-5
Q407	F-4
Q408	F-5
Q409	E-4



Note:

- ○——○ : parts extracted from the component side.
- ○ : Through hole.
- ▒▒▒ : Pattern from the side which enables seeing.

(The other layers' patterns are not indicated.)

Caution:	
Pattern face side: (Side B)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Side A)	Parts on the parts face side seen from the parts face are indicated.

02

- Use VCO BOARD is for unit replacement/repair. Use it only as reference material.

【VCO BOARD】

• Use VCO BOARD is for unit replacement/repair. Use it only as reference material.

【TX BOARD】

【ANT BOARD】

Note:

- All capacitors are in μF unless otherwise noted. pF: μμF 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4 W or less unless otherwise specified.
- ∧ : internal component.
- B+ : B+ Line.
- : adjustment for repair.
- Power voltage is dc 9 V and fed with regulated dc power supply from external power voltage jack (J404).
- Voltages are dc with respect to ground under no-signal conditions.
- Voltages are taken with a VOM (Input impedance 10 MΩ). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.

● **WAVEFORMS**

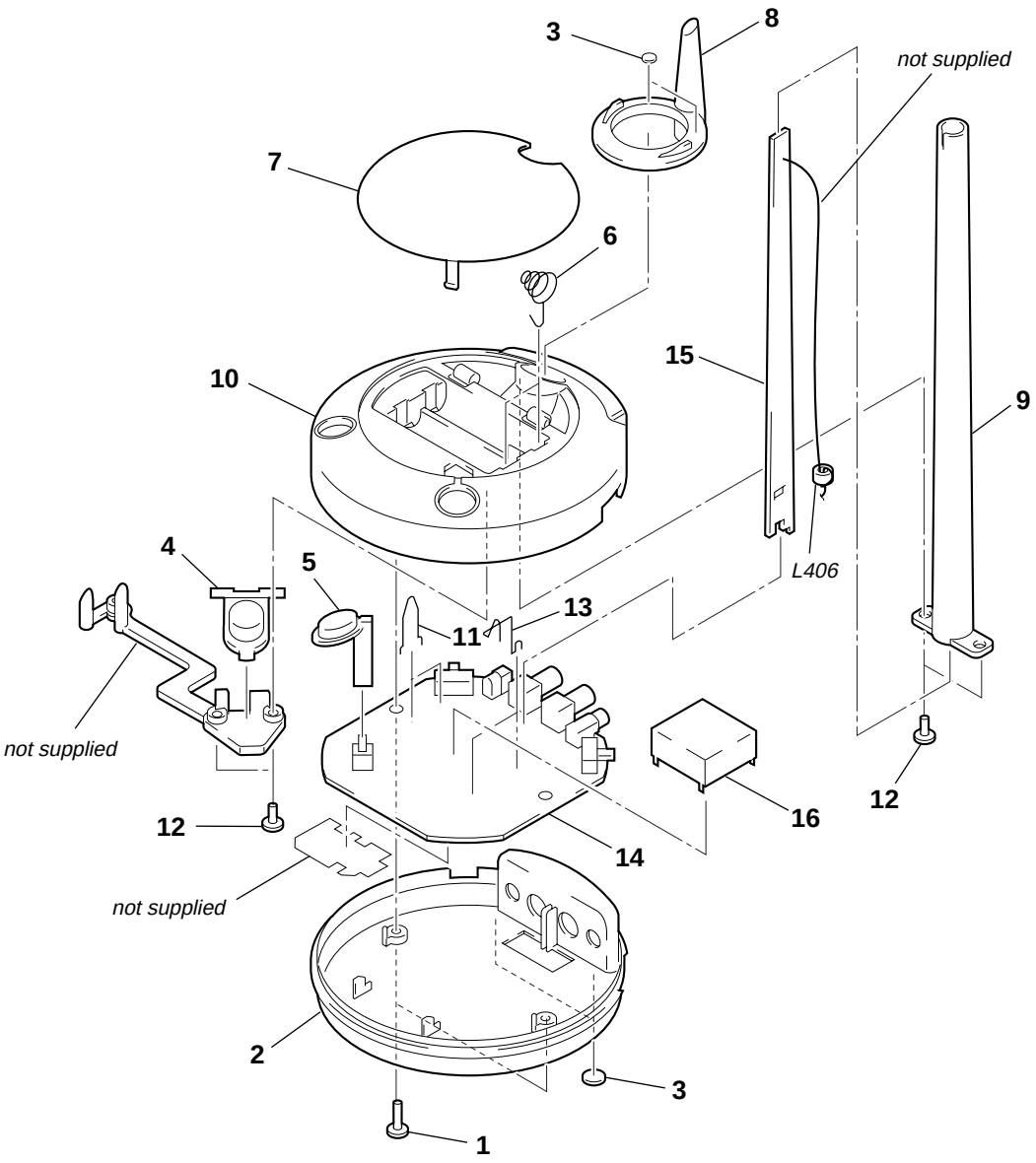
① 23.6mVp-p, 20.2 μsec
VOLT/DIV : 5m V AC
TIME/DIV : 10 μsec

② 2.0Vp-p, 20.2 μsec
Q409 (E) VOLT/DIV : 500m V AC
TIME/DIV : 10 μsec

SECTION 4
EXPLODED VIEW

NOTE :

- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked " * "are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.



Ref. No.	Part No.	Description	Remark
1	7-685-106-19	SCREW +P 2X10 TYPE2 NON-SLIT	
2	4-994-922-01	CABINET (LOWER)	
3	4-984-729-01	FOOT, RUBBER	
4	4-993-652-01	BUTTON, OPEN	
5	4-994-931-01	BUTTON, POWER	
6	4-987-658-02	SPRING, BATTERY COIL	
7	4-994-923-01	LID, BATTERY CASE	
8	4-994-925-01	CAP, ANTENNA	
* 9	4-994-924-01	PIPE ANTENNA	
10	4-994-921-01	CABINET (UPPER)	
11	4-994-928-01	TERMINAL (+), CHARGE	
12	7-685-105-19	SCREW +P 2X8 TYPE2 NON-SLIT	
13	4-994-930-01	TERMINAL (-), CHARGE	
* 14	A-4542-512-A	TX BOARD, COMPLETE	
15	1-670-934-11	ANT BOARD	
* 16	A-4542-532-A	VCO BOARD, COMPLETE	
L406	1-500-549-11	CORE, FERRITE	

ANT TX

SECTION 5
ELECTRICAL PARTS LIST

NOTE :

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms
  METAL : Metal-film resistor
  METAL OXIDE :Metal oxide-film resistor
  F : nonflammable
- Items marked " * "are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u : μ , for example :
  uA.... : μ A.... , uPA.... : μ PA....
  uPB.... : μ PB.... , uPC.... : μ PC....
  uPD.... : μ PD....
- CAPACITORS
  uF : μ F
- COILS
  uH : μ H

When indicating parts by reference number, please include the board.

Ref. No.	Part No.	Description			Remark
	1-670-934-11	ANT BOARD			
		**********			
**********					
*	A-4542-512-A	TX BOARD, COMPLETE			
		**********			
	4-994-928-01	TERMINAL (+), CHARGE			
	4-994-930-01	TERMINAL (-), CHARGE			
		< CAPACITOR >			
C401	1-104-760-11	CERAMIC CHIP	0.047uF	10%	50V
C402	1-119-866-11	CERAMIC CHIP	0.68uF	10%	10V
C403	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C405	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C407	1-124-463-00	ELECT	0.1uF	20%	50V
C408	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C409	1-124-257-00	ELECT	2.2uF	20%	50V
C410	1-131-379-00	TANTALUM	22uF	10%	10V
C411	1-104-760-11	CERAMIC CHIP	0.047uF	10%	50V
C412	1-119-866-11	CERAMIC CHIP	0.68uF	10%	10V
C413	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C414	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C415	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C416	1-126-786-11	ELECT	47uF	20%	16V
C417	1-124-257-00	ELECT	2.2uF	20%	50V
C418	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C419	1-126-786-11	ELECT	47uF	20%	16V
C420	1-124-464-11	ELECT	0.22uF	20%	50V
C421	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C422	1-163-131-00	CERAMIC CHIP	390PF	5%	50V
C423	1-163-131-00	CERAMIC CHIP	390PF	5%	50V
C424	1-124-257-00	ELECT	2.2uF	20%	50V
C425	1-163-135-00	CERAMIC CHIP	560PF	5%	50V
C426	1-126-786-11	ELECT	47uF	20%	16V
C427	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C428	1-126-382-11	ELECT	100uF	20%	16V
C430	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C431	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C432	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C433	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C434	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C435	1-126-786-11	ELECT	47uF	20%	16V
C436	1-126-162-11	ELECT	3.3uF	20%	50V
C437	1-124-261-00	ELECT	10uF	20%	50V
C438	1-164-182-11	CERAMIC CHIP	0.0033uF	10%	50V
C439	1-126-382-11	ELECT	100uF	20%	16V
C440	1-126-786-11	ELECT	47uF	20%	16V
C441	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
		< TRIMMER >			
CT401	1-141-486-11	CAP, ADJ 10PF			
		< DIODE >			
D401	8-719-066-59	LED SA3511 (POWER ⊓ ON)			
D402	8-719-066-60	LED SM3511 (POWER Ⅱ OFF/CHG)			
D404	8-719-991-33	DIODE 1SS133T-77			
D405	8-719-991-33	DIODE 1SS133T-77			
D406	8-719-109-85	DIODE RD5.1ES-B2			
D407	8-719-991-33	DIODE 1SS133T-77			
D408	8-719-991-33	DIODE 1SS133T-77			
		< IC >			
IC401	8-759-998-71	IC BA3308F			
IC402	8-759-537-90	IC KIA78S05P-TP			
IC403	8-759-701-39	IC NJM3404AM			
		< JACK >			
J401	1-764-270-11	JACK,STEREO MINIATURE(DIA.3.5)			(AUDIO IN B)
J402	1-784-910-11	JACK, PIN (AUDIO IN A R)			
J403	1-784-910-21	JACK, PIN (AUDIO IN A L)			
J404	1-573-667-11	JACK,DC(POLARITY UNIFIED TYPE)			(DC IN 9V)
		< COIL >			
L401	1-408-096-00	INDUCTOR	470uH		
L403	1-410-336-31	INDUCTOR	220uH		
L404	1-500-419-21	INDUCTOR, FERRITE BEAD			
L405	1-500-419-21	INDUCTOR, FERRITE BEAD			
L406	1-500-549-11	CORE, FERRITE			
L411	1-408-096-00	INDUCTOR	470uH		
		< LINE FILTER >			
LF401	1-411-236-11	FILTER, EMI			
LF402	1-403-601-21	FILTER			
		< TRANSISTOR >			
Q401	8-729-119-78	TRANSISTOR 2SC403SP-51			
Q403	8-729-045-02	TRANSISTOR KTC3200GR-AT			

Ref. No.	Part No.	Description			Remark
Q404	8-729-045-00	TRANSISTOR	SBX1639-02		
Q405	8-729-045-02	TRANSISTOR	KTC3200GR-AT		
Q406	8-729-045-00	TRANSISTOR	SBX1639-02		
Q407	8-729-045-02	TRANSISTOR	KTC3200GR-AT		
Q408	8-729-045-02	TRANSISTOR	KTC3200GR-AT		
Q409	8-729-045-02	TRANSISTOR	KTC3200GR-AT		
		< RESISTOR >			
R401	1-216-085-00	METAL CHIP	33K	5%	1/10W
R402	1-216-304-11	METAL CHIP	3.3	5%	1/10W
R403	1-216-025-91	RES,CHIP	100	5%	1/10W
R404	1-216-085-00	METAL CHIP	33K	5%	1/10W
R405	1-216-025-91	RES,CHIP	100	5%	1/10W
R406	1-216-085-00	METAL CHIP	33K	5%	1/10W
R407	1-216-049-91	RES,CHIP	1K	5%	1/10W
R408	1-216-049-91	RES,CHIP	1K	5%	1/10W
R409	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R410	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R411	1-216-085-00	METAL CHIP	33K	5%	1/10W
R412	1-216-304-11	METAL CHIP	3.3	5%	1/10W
R413	1-216-025-91	RES,CHIP	100	5%	1/10W
R414	1-216-085-00	METAL CHIP	33K	5%	1/10W
R415	1-216-025-91	RES,CHIP	100	5%	1/10W
R416	1-216-085-00	METAL CHIP	33K	5%	1/10W
R417	1-216-049-91	RES,CHIP	1K	5%	1/10W
R418	1-216-049-91	RES,CHIP	1K	5%	1/10W
R419	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R420	1-216-129-00	METAL CHIP	2.2M	5%	1/10W
R421	1-216-081-00	METAL CHIP	22K	5%	1/10W
R422	1-216-121-91	RES,CHIP	1M	5%	1/10W
R425	1-216-033-00	METAL CHIP	220	5%	1/10W
R426	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R427	1-216-097-91	RES,CHIP	100K	5%	1/10W
R428	1-216-115-00	METAL CHIP	560K	5%	1/10W
R429	1-216-089-91	RES,CHIP	47K	5%	1/10W
R430	1-216-133-00	METAL CHIP	3.3M	5%	1/10W
R431	1-216-097-91	RES,CHIP	100K	5%	1/10W
R432	1-216-081-00	METAL CHIP	22K	5%	1/10W
R433	1-216-097-91	RES,CHIP	100K	5%	1/10W
R435	1-216-033-00	METAL CHIP	220	5%	1/10W
R436	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R437	1-216-085-00	METAL CHIP	33K	5%	1/10W
R438	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R439	1-216-085-00	METAL CHIP	33K	5%	1/10W
R440	1-216-049-91	RES,CHIP	1K	5%	1/10W
R441	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R442	1-216-073-00	METAL CHIP	10K	5%	1/10W
R443	1-216-085-00	METAL CHIP	33K	5%	1/10W
R444	1-216-073-00	METAL CHIP	10K	5%	1/10W
R445	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R446	1-216-049-91	RES,CHIP	1K	5%	1/10W
R447	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R448	1-216-093-00	METAL CHIP	68K	5%	1/10W
R449	1-216-081-00	METAL CHIP	22K	5%	1/10W
R450	1-216-081-00	METAL CHIP	22K	5%	1/10W
R451	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R452	1-216-081-00	METAL CHIP	22K	5%	1/10W
R454	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R455	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R456	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R457	1-216-025-91	RES,CHIP	100	5%	1/10W
R458	1-216-085-00	METAL CHIP	33K	5%	1/10W
R460	1-216-029-00	METAL CHIP	150	5%	1/10W
R461	1-216-043-91	RES,CHIP	560	5%	1/10W
R462	1-216-043-91	RES,CHIP	560	5%	1/10W
R463	1-216-037-00	METAL CHIP	330	5%	1/10W
R464	1-216-073-00	METAL CHIP	10K	5%	1/10W
R465	1-216-073-00	METAL CHIP	10K	5%	1/10W
R466	1-216-113-00	METAL CHIP	470K	5%	1/10W
R467	1-216-089-91	RES,CHIP	47K	5%	1/10W
R468	1-216-049-91	RES,CHIP	1K	5%	1/10W
R469	1-216-081-00	METAL CHIP	22K	5%	1/10W
R470	1-216-045-00	METAL CHIP	680	5%	1/10W
		< JUMPER RESISTOR >			
R423	1-216-295-00	METAL CHIP	0	5%	1/10W
		< VARIABLE RESISTOR >			
RV401	1-241-764-11	RES, ADJ, CERMET 10K (SUB CARRIER (L-R) MODULATION FACTOR)			
RV402	1-241-764-11	RES, ADJ, CERMET 10K (SEND FREQUENCY)			
RV403	1-238-601-11	RES, ADJ, CARBON 22K (SEND FREQUENCY)			
RV404	1-241-764-11	RES, ADJ, CERMET 10K (MAIN CARRIER MODULATION)			
RV405	1-241-762-11	RES, ADJ, CERMET 2.2K (SUB CARRIER FREQUENCY)			
		< SWITCH >			
S401	1-771-374-11	SWITCH, SLIDE (2C-2P) (NOISE FILTER)			
S402	1-771-373-11	SWITCH, SLIDE (1C-3P) (CHANNEL)			
S403	1-771-375-11	SWITCH, PUSH (POWER)			
**********					
*	A-4542-532-A	VCO BOARD, COMPLETE			
		**********			
**********					
		MISCELLANEOUS			
		**********			
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